

REMARKS

Favorable reconsideration and withdrawal of the rejections set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims Status

Claim 14 remains pending in the application. Claim 14 has been amended to even more succinctly define the invention and/or to improve its form. It is respectfully submitted that no new matter has been added.

Section 112 Rejection

Claim 14 is rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the Official Action.

In response, Claim 14 has been amended *inter alia* to recite that the invention is incorporated in a cellular phone rather than “constructed as” a cellular phone. Upon receipt of the Official Action, this amendment to Claim 14 was informally discussed with the Examiner, who tentatively indicated that it would avoid the grounds of the rejection. It is respectfully submitted that the rejection has, in fact, been overcome.

Art Rejection

Claim 14 is are rejected under 35 U.S.C. § 103(a) as being unpatentable over previously-cited and -applied Mehlhorn, et al. in view of newly-cited U.S. Patent No. 6,539,157 (Doi).

The grounds of the rejection are succinctly set forth in the Official Action.

Response to Art Rejection

The rejection is respectfully traversed.

Amended Claim 14 calls for an apparatus that includes a layered board including an optical layer comprised of an optical waveguide layer capable of transmitting the optical signal in a planar manner in the waveguide layer; a second layer capable of transmitting at least one of an electrical signal and an optical signal; an insulating layer interposed between the optical layer and the second layer; a signal connecting path penetrating the insulating layer, the signal connecting path establishing interconnection of a signal between the optical layer and the second layer, and the signal connecting path performing both a function of transmitting an electrical signal and a function of transmitting an optical signal; means for transmitting and receiving a high-frequency signal; and means for processing the high-frequency signal. The optical waveguide comprises one of a conical and hemispherical light scattering structure, the light scattering structure being disposed in the optical waveguide layer, and a signal being transmitted between the signal connecting path and the optical waveguide layer through the light scattering structure. The apparatus is incorporated in a cellular phone.

A feature of the claimed invention is that the optical waveguide includes one of a conical and hemispherical light scattering structure. See, for example, paragraph [0061] at page 16, lines 2 through 14 of the specification. By using a conical or hemispherical light scattering structure in the waveguide, it is possible to provide an optical signal of a light emitting device positioned in a vertical direction to an optical layer and a light receiving device effectively. Furthermore, it is possible to send an optical signal to one or more light receiving devices, which are selected from a plurality of light receiving devices connected with an optical layer. Similarly, it is possible to send one or more optical signals from one or more light emitting devices, which are selected from a plurality of light emitting devices

to one or more selected light receiving devices. A layered board including either the conical or hemispherical light scattering structure has the advantages of effectively transmitting a signal between the signal connecting path and the optical waveguide layer and allowing a layered board including the waveguide to be made relatively thin. Consequently, a cell phone incorporating the claimed apparatus has the advantages of being smaller in size and providing space for other phone features.

Mehlhorn, et al. does not disclose or suggest using a conical or hemispherical light scattering structure in an optical waveguide.

Doi is merely cited for disclosing layered circuit board for use within cell phones and other applications. Doi also does not disclose or suggest using a conical or hemispherical light scattering device in an optical waveguide.

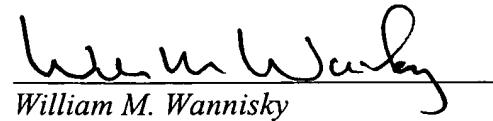
In view of the foregoing, it is respectfully submitted that independent Claim 14 is allowable over Mehlhorn, et al. and Doi whether taken individually or in combination.

Closing Comments

It is respectfully submitted that Claims 14 is allowable over the art of record and that the application is in condition for allowance. Favorable reconsideration and early passage to issue of the present application are earnestly solicited.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our New York office at the address shown below.

Respectfully submitted,


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